AP Calc

Area approx and exact

1. Find the approximate area of the region bound by the function $f(x) = -x^2 + 9$ and the x-axis in the interval [0, 3] using right endpoint approximations with 5 sub-intervals.

2. Use trapezoidal approximations with 6 sub-intervals to approximate the area under the curve $f(x) = x^3 - 4x^2$ on the interval [4, 7].

3. Use midpoint approximations to estimate the area under $f(x) = x^2$ on [2,8].

4. Non-Calc: Find the actual area bound by the curve given by the function $f(x) = \frac{1}{\sqrt{x}} + 3$ and the x axis on the interval [1, 9].

5. Non-Calc: Find the actual area bound by *f*(*x*) and the x-axis on the interval $\left[0, \frac{3\pi}{2}\right]$ if $f(x) = 2\sin(x)$.

6. Evaluate $\int_1^{\frac{e}{2}} \frac{-3}{2x}\,dx$

7. A particle moves along a horizontal path such that its velocity is defined by $v(t) = 3^{2x-4} - 6$ where *t* = time in seconds and *v*(*t*) is measured in *ft/sec*. What is the particles total distance and displacement in the first 6 seconds?

8. Given: $\frac{dy}{dx}=\frac{4x^2y}{\sqrt{x}}$ and $f(3)=-5$, find $f(x)$.

9. Find the area between the function and the $x$-axis if $f(x)=-6x^2+12x+18$ [0, 4].

10. Given: $\int_2^8 f(x)dx=6 \quad \& \quad \int_2^8 g(x)dx=14$

Find: $\int_2^8 \left(f(x)-3g(x)\right)dx$

11. Evaluate: $\int_8^{17} \frac{x^2}{\sqrt{3x-5}}dx$

12. A rocket is launched from a platform. After 3 seconds, the velocity is known to be 19 feet per second.

A) Find the velocity function. B) When does it reach its maximum height?

C) What is the total distance traveled by the rocket in the first 6 seconds of flight?